

rod, but holds the arm perfectly immovable in any position, three contacts being made. The arm will support any weight that will not actually break it. On some clamps a micrometer screw allows the arm to be moved while supporting the full weight that it can carry. Those who have struggled with the old type of retort stand clamp which wobbles in all possible directions will welcome the new invention should it be put upon the market.

WILFRED MARK WEBB.

THE THIRD TANGANYIKA EXPEDITION.¹

I LEFT London for Cape Town on March 24, 1904, proceeding thence to Chinde, and up the Zambesi and Shiré Rivers, to Blantyre and Zomba, in British Central Africa. In Zomba I reported myself to Sir Alfred Sharpe, and from him received much advice and assistance before leaving shortly for the Upper Shiré and Lake Nyasa. In the region of this lake I stayed, roughly, three weeks—one week on the gunboat anchored at the south end, one week ascending the lake, and a week in Karonga—before starting to cross the plateau to Tanganyika.

I collected, as far as possible in the short time, specimens to illustrate the flora of the lake—dried specimens, algae scraped from rocks, &c., and tow-nettings containing diatoms and other of the more minute organisms. I made no systematic attempt to collect fish, but brought a few specimens, in addition to some leeches, crabs, a species of prawn (of interest as none had been hitherto recorded from the lake), and a sponge.

Karonga was left on July 5, and after an unavoidable delay on account of illness among my men, I arrived at Niamkolo, at the south end of Tanganyika, on July 27. I made this spot my headquarters for more than two months, though during the period I stayed a week at Kituta. I purchased at once a large dug-out canoe and hired a crew, so that I was able from the first to fish, dredge, and take tow-nettings. Meanwhile, I made arrangements with the owner of a large dau in Ujiji to hire his vessel, and this was dispatched to the south end of the lake to pick me up. I sailed on board the dau on September 23, and for the rest of my time on the lake cruised about, visiting as far as possible the most interesting and likely places on the lake shore. I camped on land whenever circumstances permitted, but my stays varied, according as I found much or little of value to me. Although I made some attempts, I found it almost impossible to dredge satisfactorily in deep water by means of the dau, so I was reduced to dredging from the canoe, in which case, of course, we had not sufficient power to dredge at any depth. On one occasion, by the kindness of the captain, I was permitted to make an attempt from the German gunboat, but unfortunately I lost the dredge and a large part of the rope, by the snapping of the rope under the strain.

I collected fish on every possible occasion, but though we tried various methods of catching them, the majority were obtained direct from the native fishermen. The largest fish I saw was a Siluroid (probably *Clarias*), 155 cm. in length, and weighing 30.6 kilograms. Tow-nettings were taken systematically at various times before and after dark, in various places and at various seasons. These consisted, as a rule, principally of phyto-plankton, but there were also prawns, copepods, ostracods, and insect larvæ taken in this fashion. The quantity of material obtained by tow-netting became markedly less during the rainy season. The larger representatives of the flora were also collected, but show, on the whole, little difference from the corresponding water-weeds of Nyasa. Scrapings from the rocks and submerged stems of plants produced various of the smaller algae, while a few fungi were brought from the rotting wood of the canoe.

Five or six species of prawns were collected, in addition to those already known from the lake, some among the rocks at the water's edge, others by dredging in a few fathoms. Some two or three species of crabs were obtained, and at least two species of *Argulus*. These latter were perhaps most common from the mouth-cavity, gill-bars, and surface of the body of various large Siluroids,

¹ From a report by Mr. W. A. Cunningham, Christ's College, Cambridge.

but they were also frequently present upon large specimens of Lates, and occasionally on other scaly fishes. Two forms of true parasitic copepods were found—one on the gills of a Siluroid, and the other attached at the junction of the pelvic fins of a *Polypterus*. Of worms, a few *Oligochætes* were collected and a considerable number of leeches.

In addition to these were some Turbellaria, and various endo-parasites—Cestoda, Trematoda, and Nematoda—principally from the gut of fishes. Among the Polyzoa is, at any rate, one form with horseshoe-shaped lophophore, which has not yet been described from Tanganyika. There is probably little of interest in the molluscs collected, as my work was confined to the comparatively shallow water. I was struck by the irregularity in the appearance of the Tanganyika medusa, or rather the uncertainty of finding it at any particular time or place. It is doubtless, like all such forms, driven to and fro by wind and currents, but it is curious that one may be a month or more on the lake without seeing a single specimen. I have brought back a few in formalin, for museum purposes, and others preserved with a view to the histology. Some quantity of sponge was collected, encrusting in every case submerged rocks or shells.

Apart from actual collecting, some observations of physical interest were made. Attempts were made, both on Nyasa and Tanganyika, to observe the seiche alterations in water-level, and at the south end of Tanganyika the actual level of the water was marked, with the view of affording some basis of comparison for the use of future investigators. A good many readings of the water temperature have been taken, which should prove interesting, as I believe nothing has ever been recorded from these lakes before. The temperature in general seems very high, the lowest obtained on the lake being only 73°.3, and the highest recorded 81°.0. At a depth of 76 fathoms (length of the sounding-line) the temperature appears fairly constant, for readings taken on various occasions, and at different spots, only vary between 74°.1 and 74°.8.

The total length of time spent on and around Tanganyika was about eight months. Dismissing the dau at Usumbura, at the north end of the lake, I began on March 18, 1905, the journey overland to the western shore of the Victoria Nyanza. This took rather longer than was expected, owing to the bad weather and the famine-stricken nature of the country, but Bukoba, a German station on Nyanza, was reached on April 16. During a stay of ten days waiting for the steamer, and during a short stay in Entebbe, the British capital, I was able to do some collecting in this lake also. As far as possible, representatives of the water flora were obtained, for the sake of comparison with the plants collected on Nyasa and Tanganyika. A few tow-nettings were taken, and, in addition to the smaller plants and animals thus obtained, there were also collected a few molluscs, some *Argulus*, and certain endo-parasites. More interesting was the finding of a species of prawn and a sponge, as no sponge had been recorded from the lake before.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

THE council of King's College, London, has received a donation of 500l. from the Drapers' Company for the further equipment of the physics laboratory, especially for the promotion of research.

PROF. W. W. WATTS, F.R.S., assistant professor of geology and professor of geography at the Birmingham University, has been appointed professor of geology at the Royal College of Science, South Kensington, vacant by the retirement of Prof. J. W. Judd, C.B., F.R.S. In view of the changes in organisation that may be found desirable in the Royal College of Science and the Royal School of Mines after the consideration of the report of the departmental committee on the college, the appointment has been made a temporary one.

THE council of the Armstrong College of Durham University in Newcastle has resolved to found a chair of

electrical engineering, and has voted a sum of 2600*l.* toward the equipment of electrical engineering laboratories. At the end of the current session two fellowships of 125*l.* a year will be offered for competition, on condition that the holders should spend their time in the prosecution of definite research or in the pursuance of a definite line of advanced study. Mr. H. Morris-Airey, lecturer and demonstrator in physics in the University of Manchester, has been appointed lecturer in physics at the college in succession to Mr. R. J. Patterson.

THE movement for extending higher education in the Potteries has received (says the *Lancet*) a great impetus from the offer by the Duke of Sutherland of Trentham Hall to the Staffordshire County Council for higher educational purposes. For some time a scheme to establish a university college for North Staffordshire has been energetically brought forward, and promises of help have been received from the North Staffordshire Institute of Mining and Mechanical Engineers, from a joint committee of china and earthenware manufacturers, and from various other sources. The scheme commended itself so much to the county council that it offered to contribute 12,500*l.* to the building fund, and to undertake the maintenance of the college. The hall is considered to be in every way admirably adapted for the purposes of a university college.

THE following gifts in aid of higher education have been announced in *Science*. The Pennsylvania College for Women in Pittsburg has succeeded in raising 38,000*l.* to pay off a mortgage resting upon its property, and to make a beginning in securing an endowment. After the mortgage has been paid, the college will possess as the nucleus of an endowment fund the sum of 25,000*l.* Mr. Andrew Carnegie has promised to contribute 10,000*l.* toward the endowment fund of Bates College when 20,000*l.* shall have been raised for the same purpose by friends of the college. The University of Pennsylvania received last month an anonymous gift of 10,000*l.* Lake Forest University has received 12,000*l.*, and the University of Wisconsin a bequest of 2000*l.* by the will of the late Mrs. Fannie Parker Lewis, for the establishment of scholarships for needy young women students.

SIR PHILIP MAGNUS, the new Member of Parliament for the University of London, after the formal announcement of the result, proposed a vote of thanks to the Vice-Chancellor for the manner in which, as returning officer, he had conducted the election. During the course of his remarks, Sir Philip Magnus said that during the last two years he has served on a departmental committee presided over by Mr. Haldane to inquire into the working of the Royal College of Science and Royal School of Mines, in relation to other educational institutions. The report of the committee is settled, and Sir Philip Magnus said he was disclosing no secrets when he announced that, if effect is given to the recommendations, London will before long possess an institution, closely connected with the University, for the higher scientific training, and for the application of science to engineering in all its branches, which will compare favourably with any similar school in Europe or America.

At the meeting of the Sociological Society on January 22, Prof. R. M. Wenley, of the University of Michigan, read a paper on sociology as an academic subject. Sociology, although taught in all the great universities of the United States, is academically in an experimental stage. Like other new subjects, it has received much criticism as being unsuitable for inclusion in the university curriculum. It is said to lack disciplinary value, and it is urged, moreover, that students come to it without the necessary basis in previous knowledge. Prof. Wenley attaches little importance to the first objection, but admits that the second is of real weight. Answering the question, What ought sociology to be as an academic subject? Dr. Wenley suggested that at Cambridge it might well form a part of the moral science tripos; at the Scottish universities, it might be attached to the *practical* training of the theological faculty; in London the opportunities for ethnological, linguistic, and economic research are in need of its complementary aid. Wherever ethics, psychology,

economics, anthropology, or the various forms of ethnology have a place, sociology is needed as a coordinate discipline. The paper concluded by urging that sociology must be a science conducted by scientifically trained, competent experts, and not merely a pottering-round so-called problems of local or even national origin by well meaning enthusiasts.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, December 14, 1905.—"On the Distribution of Chlorides in Nerve Cells and Fibres." By Prof. A. B. Macallum and Miss M. L. Menten. Communicated by Prof. W. D. Halliburton, F.R.S.

At the present day, when numerous observers are seeking the explanation of certain nerve-phenomena on an electrolytic basis, it is imperative that accurate knowledge of the electrolytes present should be first obtained. Prof. Macallum has carried out previous work in this direction, and has discovered methods for detecting the inorganic salts microchemically. He has, among other things, found that nerve cells are destitute of potassium. This element, at any rate, is not revealed by tests which show its presence in other tissues, though it is possible, as Prof. J. S. Macdonald has pointed out, that it may be present in a "masked" form, from which it is liberated by injury. Another reaction at which Macallum has worked is the well known reduction stain with silver nitrate. The staining has been attributed by some histologists to the formation and subsequent reduction in sunlight of a silver-proteid compound. But this cannot be the case, because proteids freed from inorganic salts do not give the reaction. The test is shown to be entirely due to inorganic chlorides, and thus forms a method of great delicacy for the detection and localisation of chlorine in the tissues.

The present paper deals with the distribution of chlorine in the nerve-units. The chlorides present are probably numerous, but sodium chloride is the most abundant. By the ordinary method, nerve fibres exhibit the well known crosses of Ranvier. One limb of the cross is due to the presence of chlorides in the cementing substance which forms a ring at the junction of the neurilemmal elements. The other is due to staining of the axis cylinder itself; this usually exhibits itself, not as a continuous dark stain, but as a series of transverse striæ known as Frommann's lines. It is, however, shown that the same appearance can be produced by suitable modifications of manipulation at any portion of an axis cylinder, and that its greater intensity at the nodes is simply due to the fact that at these spots the reagent can penetrate more readily; the sheath of the fibre presents considerable impediment to the passage of the reagent inwards and of chlorides outwards.

The next question that arises is whether Frommann's lines indicate a definite preexisting arrangement of the chlorides in layers, or whether the appearance is an accident explicable on a physical basis. It is quite conclusively shown that the latter explanation is the correct one. The appearance can be most successfully imitated in capillary tubes filled with chromate-holding gelatin or white of egg, and is merely the result of physical processes, as Boehm and Liesegang were the first to point out.

Nerve cells also contain chlorides, but the intensity of the reaction is less, and is usually limited to the peripheral portions of the cell, principally because of the difficulty the reagent has of penetration. The nucleus, however, like other nuclei, is apparently free from chlorides.

The distribution of electrolytes such as sodium chloride in the colloid material of an axis cylinder would not permit ions carrying an electrical charge to travel unimpeded, and in consequence the change of potential transmitted would progress with diminished velocity. This diminution would bring into line as parallel phenomena the nerve impulse and the electrical current of action. It must, however, be freely admitted that caution should be shown in drawing conclusions of this kind where so much is still unknown.